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(58) Field of Search

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(54) Entertainment system

(57) An audio-on-demand home entertainment system 10 for playback of audio recordings in which the user's personal record, CD or tape collection is provided as a "virtual record collection" at a remote site 60 thereby avoiding many problems associated with acquiring and maintaining a record collection. A single playback device is adapted to receive the different types of recorded media available thereby avoiding the need for separate CD, audio tape, record and DAT players.

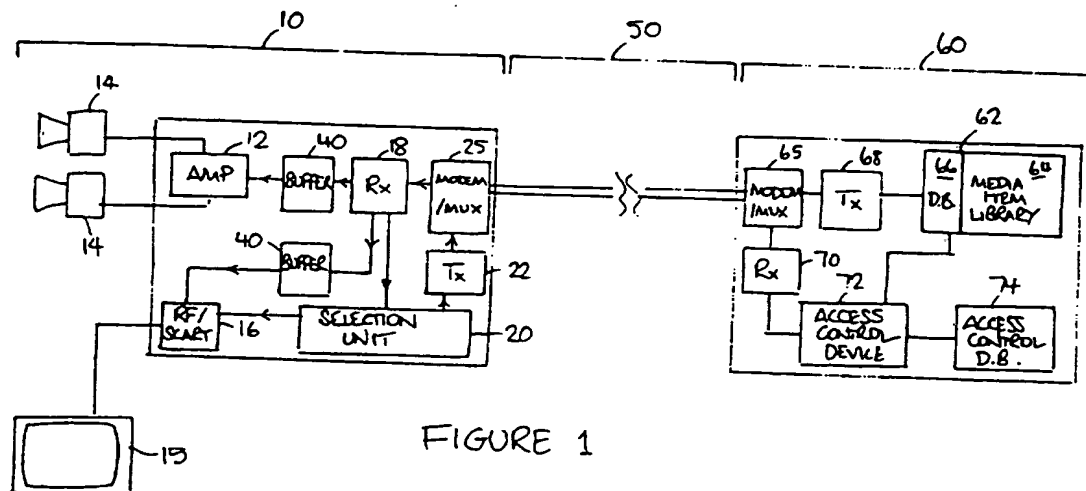


FIGURE 1

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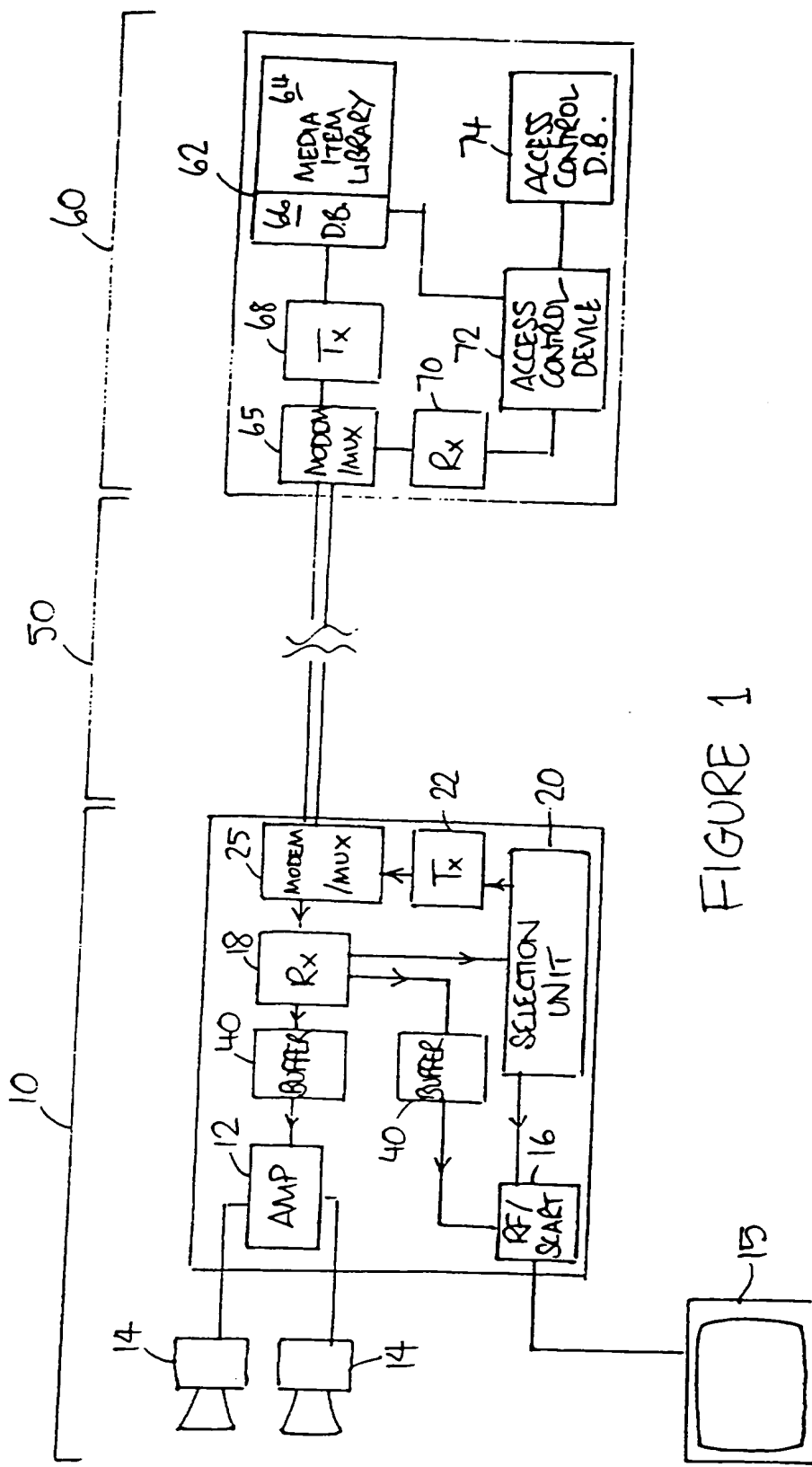


FIGURE 1

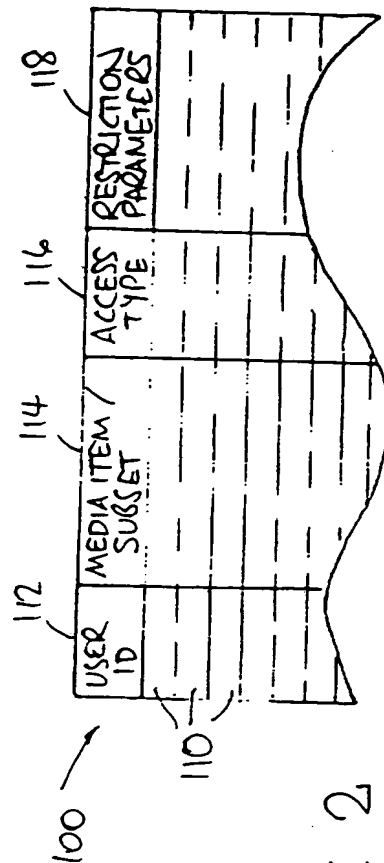


FIGURE 2

ENTERTAINMENT SYSTEM

The present invention relates to home entertainment systems, and in particular to audio entertainment systems.

5

Most homes have at least several audio entertainment systems of which examples are compact disc players, record players, cassette players, DAT players and the like.

10

A common feature of all of these systems is that they require a collection of appropriate recorded media in order to provide the audio output. For example, most people acquire sizeable collections of compact discs, vinyl records, conventional audio tape and DAT cassettes and the like.

15

Maintenance of such recorded media collections has a number of disadvantages. Among the many examples of these disadvantages are the following: large collections take up a considerable amount of space which can be awkward, particularly for the occupants of small houses or flats; large collections are generally very valuable and thus prone to being stolen during burglary and expensive to replace when damaged or lost during fire or flood or generally broken or worn out in use; the media are generally quite expensive to purchase in the first instance; locating particular recordings within a large collection can be difficult unless efficient cataloguing or cross-referencing of the collection is carried out, a task which does not appeal to most people.

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There are further disadvantages associated with the procuring of, for example, CD collections. In particular, it is difficult to be sure that one will like a particular CD before purchase is made, and consequently

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many purchases may be made over the years which have not been played more than a couple of times and were therefore a waste of money.

5 A further disadvantage of possessing recorded media collections arises from the number of separate electronic devices required to play them and the associated cost of this playback equipment. For example, it may be necessary to have a CD player, an audio tape cassette deck, a record player, DAT player and the like, to access one's full collection. Acquisition of all this playback equipment is expensive, and such items are
10 themselves also prone to theft and damage. In addition, media types inevitably change with time, leaving owners of, for example, vinyl record collections wishing that they could economically upgrade to digital formats such as CD and DAT.

15 A disadvantage of existing portable audio entertainment systems is that to be of use, the recorded media must also be carried with the portable system, thus greatly decreasing the portability and invariably restricting a person to only a small part of their collection.

20 It is an object of the present invention to overcome some or all of the disadvantages of acquiring, maintaining and using a collection of recorded media such as compact discs, records, audio tapes and the like.

It is a further object to reduce the cost and equipment overhead
25 necessary to obtain playback facility of a multimedia, audio recording collection.

According to the present invention, there is provided an audio entertainment system having a remotely located recorded media library

coupled thereto by a communications link, which provides to each user a personal "virtual record collection".

5 By "record collection", we mean a plurality of recordings or recorded media items regardless of the particular type of medium from which the recordings originate or are currently stored.

10 The present invention provides an audio entertainment system comprising a playback output device and a remotely located recorded media library of media items connected thereto by a communications link, the communications link adapted to convey playback information from a media item to the playback device.

15 Embodiments of the present invention will now be described by way of example, and with reference to the accompanying drawings in which:

20 Figure 1 shows a schematic block diagram of a system according to the present invention;

Figure 2 shows an access control file stored within the access control database of the system of figure 1.

25 With reference to figure 1, there is shown a system according to a presently preferred embodiment of the present invention. A playback device 10 is located in a user's home and is coupled by way of a communications link 50 to a recorded media library system 60 located remotely from the user's home.

Although not shown in figure 1, the recorded media library system 60 will be similarly coupled to a large number of different users' playback devices 10 by similar communications links 50. This provides an economy of scale in maintenance of the media item library 60.

5

Each playback device 10 includes a playback output device which preferably comprises a stereo hi-fi amplifier 12 coupled to speakers 14 as an audio output system. The amplifier 12 is coupled to receive audio output signals from a receiver 18 which is connected to media item library 10 60 by the communications link 50. The receiver 18 may include a decryption unit (not shown) if the signals are to be transmitted in encrypted form. The receiver 18 may also include buffer stores 40 if the output signals are received at a greater rate than required during playback. The receiver may also include a data decompression device (not shown) 15 if output signals are received in compressed form over the communications link.

The playback device 10 may also include a TV interface 16 such as an RF modulator or SCART interface for coupling to a TV or monitor 20 15, which can be used as a display and or selection device to be described hereinafter.

The playback device 10 includes a user selection unit 20 including an input device such as a keyboard, remote control keypad or similar 25 device of known type. The user selection unit 20 is coupled to a transmitter 22 which is adapted to transmit signals over the communications link 50. Typically, transmitter 22 and receiver 18 share the same communications link 50 through a multiplexer 25 which may also act as a modulator / demodulator appropriate to the type of 30 communications link 50 in use.

In a preferred embodiment, the user selection unit 20 includes an integral display unit (not shown) in order to enable display of media items available for selection, and is coupled to the receiver 18 to obtain, from the media item library 60, details of media items available. Alternatively,
5 the user selection unit 20 may be adapted to interface with the TV or monitor 15 for display purposes.

The TV interface 16 may be supplemented with, or replaced by a computer interface enabling interconnection with a personal computer or
10 the like. The computer monitor may then be used as a display unit for selection unit 20 and the computer keyboard as a selection unit 20 user input device. Where the computer system is provided with an appropriate hi-fi sound system as are now becoming popular, the computer could also then act as a playback output device for the audio media being
15 played back.

The communications link 50 may, for example, be a standard telephone or ISDN link, a co-axial cable link, a fibre-optic link, or a mobile telephone or cellular radio satellite or microwave link.

20

Recorded media library system 60 comprises a media item library 62 which includes a plurality of recorded items 64 corresponding to, for example, compact disc recordings, tape recordings, vinyl discs and the like. The actual form of the recorded media may be implemented in a
25 number of ways. For example, preferably all CD, tape and other recordings may be stored in electronic form on computer disk drives of optical or magnetic type, ie. the media item library 62 is provided on a large file server system. Alternatively, multiple playing apparatus may be provided with suitable mechanical disk changing systems.

30

Forming part of the media item library 62 is a media item database 66 listing the identity of all media items stored, their location or starting addresses, and preferably textual or graphical data relating thereto. Such data preferably includes classification data identifying artist(e), composer, performer, music category and the like and other information of general interest.

The media item library is coupled to a media item transmitter 68 which is adapted to transmit recordings onto the communications link 50 via a modulator / demodulator 65 suitable for the type of communication link 50 in use. The media item transmitter may include a data compression device and/or encryption device corresponding to those previously discussed in relation to the playback output device 10.

A media item selection receiver 70 is coupled to receive signals from the user selection unit 20 to provide access to the media library, via an access control device 72, which instructs the library which media items should be passed to media item transmitter 68 for transmission to a user's playback output device 10. Access control device 72 maintains an access control database 74 which will be described in greater detail hereinafter.

In use, a user makes a selection of the music that he wishes to hear on a user input device on selection unit 20 (or personal computer coupled thereto). Choice may be effected by viewing, on the integral user selection unit display (or TV or monitor 15) the selections available to him which have been transmitted to the playback output device 10 from the access control device 72. The media item selection is then transmitted to the media item library system 60 via transmitter 22, modem 25, communications link 50 and modem 65 to the media item selection receiver 70, where it is passed to access control device 72. Access

control device 72 checks with access control database that the access is authorized, and if so, initiates transmission of the media item from library 62 to the user's playback output device 10.

5 Use of the system is controlled by the access control device. In a preferred embodiment, a user would have access to a subset of the recordings in the media item library for which he had paid, ie. in the same sense as having purchased the recording. This may therefore be regarded as the user's own personal "virtual record collection". In this instance,
10 the access to the particular media item would be "unlimited".

 Other categories of access type may be envisaged. For example, a category "duration restricted" may apply where a user has paid to be able to access the media item only for a predetermined period of time (ie.
15 analogous to having borrowed a recording from a library). A category "event restricted" may apply where a user has only paid to hear a recording a predetermined number of times. Other categories might cover "sample only", ie. where a user might be permitted to hear a short sample of the media item only; or "pay per access", ie. where a user may access
20 the media item any number of times on a individual payment basis.

 To facilitate this, the access control database includes a file 100 (figure 2) which includes a number of entries 110 each of which includes a user ID field uniquely identifying the user, a media item identifier 114
25 uniquely identifying the media item or a subset of media items, an access type code 116, and any restriction parameters 118 necessary to qualify the access type code 116. Examples of restriction parameters could be the duration of the access right or a number of accesses remaining.

Other files in the database may be provided to record user credit limits or charges accrued by each user of the system, the number of media item accesses for the purposes of copyright royalty payments to artist(s) and so on.

5

As a further refinement of the system, the user selection unit 20 and TV monitor 15 (or computer interfaced thereto) may be used to provide pictures and artwork associated with the recorded media items available (eg. "album covers", program notes, track details and titles and the like),
10 as well as details of new items "in stock". The user may then browse this information to decide whether to purchase permanent or temporary access to other media items in the library. Such information could be targeted, by the media item library service provider, to a user based on the profile of his existing "virtual record collection", eg. a known preference for
15 certain types of music.

A further refinement of the system may be provided by using the media item database 66 to list, in respect of each media item, a music category which may act as a filter for selecting music to listen to. The
20 user input device may then include a means for providing selection criteria to the media item library defining a category of music to be selected. For example, if a user wishes to provide a continual selection of five hours of light jazz music for a dinner party, selection of media items from this category to be transmitted may be made automatically, and the access to
25 the relevant items paid for on a one-off basis. Alternatively, the selection may be made automatically from the user's own collection which has unrestricted access.

When entries identifying music categories are associated with each
30 recorded media item, the system may also include, in the media item

library, a user profiling means and a user targetting device. A user's virtual record collection may then be analysed by the user profiling means to identify various categories of music or entertainment to which the user is particularly partial. The user targetting means may then automatically
5 select media items in a similar category to display on the user selection unit, to be brought to the user's attention when the user reviews selections available on the user selection unit. In this way, appropriate new releases may be brought to the attention of users who may then decide whether to add these to their virtual collection, or to sample them.

10

In a preferred embodiment, the system would incorporate full compact disk functionality — ie. in terms of track sequence selection, skip, fast forward and reverse, pause. These features can be provided by appropriate use of the buffer 40 together with a continual feedback from
15 the playback output device 10 to the library system 60 via the communications link 50. For short skips and fast forward / reverse operations, the buffer 40 may offer sufficient temporary storage capacity to enable these functions autonomously of the library system 60. For other functions, the operations would be provided from the library system
20 via the access control device 72.

In a further embodiment, users' preferences for CD track sequences may be stored for future use. Thus, a user may permanently store a preselected track sequence for a given media item, and this selection may
25 be implemented when selecting the media item, eg. playing the tracks in a particular order, or omitting certain tracks. It will be understood that, given the automated media item access arrangements of the media library system, this permanent storing of track selections can be applied to a selection of media items simultaneously. For example, the user may
30 designate a favourite rock music sequence which comprises tracks from

a selection of different CDs, and this predetermined sequence can be selected, and then played automatically without further input.

5 By provision of the remote media item library to a plurality of users, the service provider effectively "stores" a media collection for the user as a virtual record collection comprising a subset of the media item library 62, some of which items may be permanently accessible to the user (ie. "owned" by), or temporarily accessible (ie. "on loan" to the user). The library may also acts as a "shop" in enabling the viewing of or
10 listening to new recordings for purchase. A mechanism may be included whereby a user may electronically authorize payment for "new" recordings to be added to the virtual collection, or for one-off uses of the system.

15 With such a system, there is then no risk to the user of having his CD collection stolen or lost. When moving house or flat there is no need to relocate one's collection: the playback output device is simply reconnected to the appropriate communication network.

20 Although the present invention is principally directed toward the provision of an entertainment system for domestic or home use, it will be understood that the invention has applicability to other environments such as business use.

25 Although presently well suited to the buried cable communication networks having sufficient bandwidth to carry the full hi-fi frequency spectrum, as mobile communications improve and costs rapidly decrease, it is possible to make the playback output device fully portable by using digital radio transmission, eg. a mobile telephone link. In this way, it will
30 be possible to "carry" one's entire record collection on holiday or the like

with a fully portable hi-fi system. In addition, it will be possible to include car-based systems in which it is possible for one to have access to one's personal record collection both in the car and at home without carrying tapes or discs.

CLAIMS

1. An audio entertainment system comprising a playback device and a remotely located recorded media library of media items connected thereto by a communications link, the communications link adapted to convey playback information from a media item to the playback device.
5
2. A system according to claim 1 wherein the playback device includes a playback output device which comprises a hi-fi amplifier and speaker system.
10
3. A system according to claim 1 or claim 2 wherein the playback device further includes a media item selection device including a user input device coupled to a media item selection transmitter adapted to transmit a user media item selection to a media item selection receiver in the remotely located media library.
15
4. A system according to claim 3 wherein the remotely located media library further includes a media item transmitter adapted to retrieve a media item corresponding to the user media item selection and to transmit said media item to said playback device over said communications link.
20
5. A system according to claim 4 further including an access control device adapted to maintain an access control database comprising a plurality of entries, each entry linking a user identification code with a media item or a subset of said media items within the remotely located media library.
25

6. A system according to claim 5 wherein each entry further includes an entry status code indicating the type of media item access permitted for the given user identification code.

5 7. A system according to claim 4 further including means for data compression adapted to reduce the transmission bandwidth required for media item transmission over the communication link.

8. A system according to claim 4 further including buffer means for temporarily storing data transmitted by the media item transmitter.

9. A system according to claim 1 wherein the communications link is selected from one of: a telephone line, a co-axial cable link, a fibre-optic link, a radio link or a microwave link.

15 10. A system according to claim 3 further including a media item browser coupled to said media item selection device including a display coupled to display information relating to media items in the media item library.

20 11. A system according to claim 10 wherein said information includes any of album cover artwork, program notes, track details, artist(e) details, music category.

25 12. A system according to claim 3 further including means for providing selection criteria to retrieve media items from the media item library according to certain predetermined characteristics.

30 13. A system according to claim 11 further including user profiling means adapted to analyse a user's preferences of music category and a

user targetting means adapted to provide information to said media item selection device to display details of media items in a similar category to those previously selected by said user.

- 5 14. A system according to claim 4 wherein the user input device further includes means to provide control functions selected from track skip, fast forward and reverse, and track sequencing facility.

- 10 15. An audio entertainment system including a user playback output device coupled via communication link to a remotely located recorded media library and including an access control device defining a subset of recorded media items in said library as a virtual record collection associated with said user playback output device.

15

Patents Act 1977
Examiner's report to the Comptroller under Section 17
(The Search report)

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Relevant Technical Fields

(i) UK Cl (Ed.N) H4K: KF42; KOD4; KOD8; KOT
 H4R: RCC; RCT; RCX

(ii) Int Cl (Ed.6) H04H, H04M

Databases (see below)

(i) UK Patent Office collections of GB, EP, WO and US patent specifications.

(ii) ONLINE: WPI

Search Examiner
 AL STRAYTON

Date of completion of Search
 4 JANUARY 1996

Documents considered relevant following a search in respect of Claims :-
 ALL

Categories of documents

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| <p>X: Document indicating lack of novelty or of inventive step.</p> <p>Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.</p> <p>A: Document indicating technological background and/or state of the art.</p> | <p>P: Document published on or after the declared priority date but before the filing date of the present application.</p> <p>E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.</p> <p>&: Member of the same patent family; corresponding document.</p> |
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Category	Identity of document and relevant passages	Relevant to claim(s)
X	WO 92/12599 A1 (YURT) page 5, lines 28-35; page 9, line 30 - page 10, line 38	ALL
X	WO 90/15497 A1 (CASTILLE) Abstract	ALL
X	US 4124773 (ELKINS) Abstract	ALL

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